# *McBasic-Gigabit*

# *Operation Manual*

## FCC Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class A computing device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which the user will be required to correct the interference at his own expense.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

The use of non-shielded I/O cables may not guarantee compliance with FCC RFI limits. This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par le ministère des Communications du Canada.

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IMC Networks warrants to the original end-user purchaser that this product, EXCLUSIVE OF SOFTWARE, shall be free from defects in materials and workmanship under normal and proper use in accordance with IMC Networks' instructions and directions for a period of six (6) years after the original date of purchase. This warranty is subject to the limitations set forth below.

At its option, IMC Networks will repair or replace at no charge the product which proves to be defective within such warranty period. This limited warranty shall not apply if the IMC Networks product has been damaged by unreasonable use, accident, negligence, service or modification by anyone other than an authorized IMC Networks Service Technician or by any other causes unrelated to defective materials or workmanship. Any replaced or repaired products or parts carry a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer.

To receive in-warranty service, the defective product must be received at IMC Networks no later than the end of the warranty period. The product must be accompanied by proof of purchase, satisfactory to IMC Networks, denoting product serial number and purchase date, a written description of the defect and a Return Merchandise Authorization (RMA) number issued by IMC Networks. No products will be accepted by IMC Networks which do not have an RMA number. For an RMA number, contact IMC Networks at PHONE: (800) 624-1070 (in the U.S and Canada) or (949) 465-3000 or FAX: (949) 465-3020. The end-user shall return the defective product to IMC Networks, freight, customs and handling charges prepaid. End-user agrees to accept all liability for loss of or damages to the returned product during shipment. IMC Networks shall repair or replace the returned product, at its option, and return the repaired or new product to the end-user, freight prepaid, via method to be determined by IMC Networks. IMC Networks shall not be liable for any costs of procurement of substitute goods, loss of profits, or any incidental, consequential, and/or special damages of any kind resulting from a breach of any applicable express or implied warranty, breach of any obligation arising from breach of warranty, or otherwise with respect to the manufacture and sale of any IMC Networks product, whether or not IMC Networks has been advised of the possibility of such loss or damage.

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## Table of Contents

FCC Radio Frequency Interference Statement ..... ii
Warranty ..... ii
About the McBasic-Gigabit ..... 1
Configuration Instructions ..... 1
LinkLoss, FiberAlert and Link Fault Pass-Through ..... 2
FX LinkLoss (FXLL) ..... 2
Using FiberAlert and LinkLoss ..... 3
Link Fault Pass-Through (LFPT) ..... 4
Additional Gigabit Features ..... 5
Installing a McBasic-Gigabit ..... 6
LED Operation ..... 7
Installation Troubleshooting ..... 8
Specifications ..... 9
IMC Networks Technical Support ..... 10
Fiber Optic Cleaning Guidelines ..... 11
Electrostatic Discharge Precautions ..... 11
Safety Certifications ..... 12

## About the McBasic-Gigabit

McBasic-Gigabit is a low-cost, preconfigured, IEEE 802.3 single-conversion media converter that converts 1000Base-TX twisted pair to 1000Base-SX multi-mode or 1000Base-LX single-mode fiber. It is available with one RJ-45 connector for the twisted pair port and an SC connector for the fiber port.

McBasic-Gigabit is also available in a single-strand fiber version which allows two wavelengths to share one fiber strand — Full-Duplex data travels on different wavelengths (1310 nm and 1550 nm) — doubling the capacity of fiber. The McBasic-Gigabit includes one RJ-45 connector and one SC fiber connector.

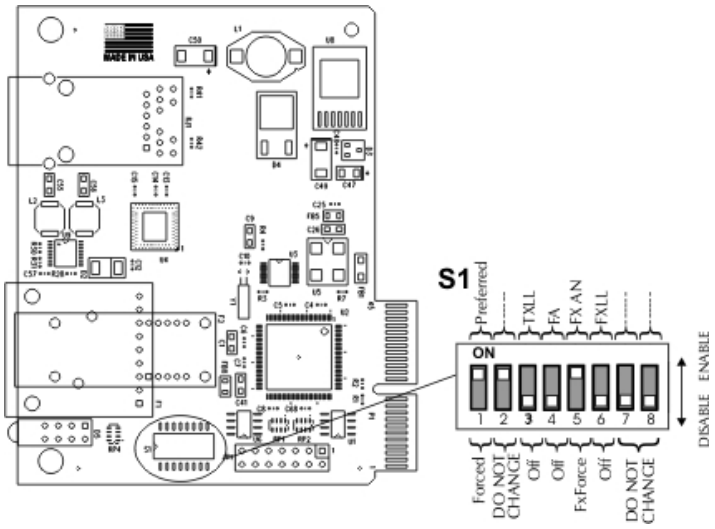
| NOTE |
| --- |
| *All McBasic-Gigabit units, including 1310 nm single-mode (TX/LX), 850 nm multi-mode fiber (TX/SX) and single-strand versions (TX/SSLX), will be referred to as McBasic-Gigabit throughout this installation guide except where differences need to be indicated.* |

## Configuration Instructions

McBasic-Gigabit has user-configurable features located on the PCB board. Please refer to the board diagram and the table for available features.

To access the McBasic-Gigabit board for configuration, loosen the two screws on the front of the unit. Slide the board out of the enclosure (faceplate is attached). Configure, then slide the board back into the enclosure and tighten the screws.

Following is the McBasic-Gigabit PCB board used to configure the unit.




**McBasic-Gigabit w/LFPT**

| DIP Switch on S1 | Feature | Default Setting |
|---|---|---|
| **1** | Forced/Preferred | ON |
| **2** | Factory use - Do not change | ON |
| **3** | TX LinkLoss | OFF |
| **4** | FiberAlert | OFF |
| **5** | FX Auto Negotiation | ON |
| **6** | FX LinkLoss | OFF |
| **7** | Factory use - Do not change | OFF |
| **8** | Factory use - Do not change | OFF |

## LinkLoss, FiberAlert and Link Fault Pass-Through

McBasic-Gigabit includes the troubleshooting features FiberAlert, TXLL, FXLL and LFPT that help locate *silent failures* on a network. Before attempting to install the module(s), understand how these features work and react to specific network configurations.

| ** WARNING ** |
|---|
| ***Installing modules without understanding the effects of LinkLoss and FiberAlert can cause functioning units to appear flawed or even non functional.*** |

## Link Integrity

During normal operation, link integrity pulses are transmitted by all point-to-point Ethernet devices. When an IMC Networks media converter receives valid link pulses, it knows that the device to which it is connected is up and sending pulses, and that the copper or fiber cable coming from that device is intact. The appropriate "LNK" (link) LED is lit to indicate this.

The IMC Networks media converter also sends out link pulses from its copper and fiber transmitters, but normally has no way of knowing whether the cable to the other device is intact and the link pulses are reaching the other end. The combination of FiberAlert and LinkLoss allows this information to be obtained, even when physical access to a remote device (and its link integrity LED) is not available.

## FX LinkLoss (FXLL)

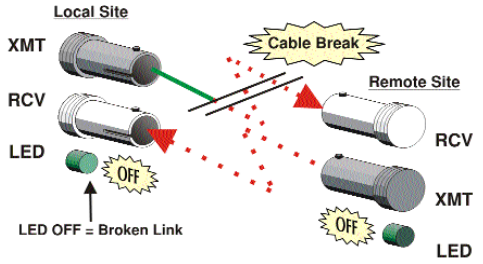
FX LinkLoss is a troubleshooting feature. When a fault occurs on the fiber segment of a conversation, FX LinkLoss detects the fault and passes this information to the twisted pair segment. If a media converter is not receiving a fiber link, FX LinkLoss disables the transmitter on the media converter's twisted pair port. This results in a loss of link on the device connected to the twisted pair port.

## TX LinkLoss (TXLL)

TX LinkLoss is a troubleshooting feature. When a fault occurs on the twisted pair segment of a conversion, TX LinkLoss detects the fault and passes this information to the fiber segment. If a media converter is not receiving a twisted pair link, TX LinkLoss disables the transmitter on the media converter's fiber port. The result is in a loss of the link on the device connected to the fiber port.

## FiberAlert (FA)

FiberAlert minimizes the problems associated with the loss of one strand of fiber. If a strand is unavailable, the IMC Networks device at the receiver end notes the loss of link. The device will then stop transmitting data and the link signal until a signal or link pulse is received. The result is that the link LED on BOTH sides of the fiber connection will go out indicating a fault somewhere in the fiber loop. Using FiberAlert, a local site administrator is notified of a fault and can quickly determine where a cable fault is located.



Product with *FiberAlert* enabled —Remote Site stops transmitting
Local Link LED is OFF indicating a break in the fiber loop

| WARNING |
| --- |
| ***Enable FiberAlert on one side of a media conversion only. Enabling it on both sides would keep both transmitters off indefinitely.*** |

## Using FiberAlert and LinkLoss

Modules ship from the factory with troubleshooting features disabled. Refer to the help file to enable/disable this feature.

## Link Fault Pass-Through (LFPT)

Link Fault Pass-Through (LFPT) is a troubleshooting feature that combines TX and FX LinkLoss from both the local and remote McBasic-Gigabit modules. LFPT is enabled by turning on both FX and TX LinkLoss on both modules. This feature allows either end of the conversion to detect a link fault occurring at the other end of the media conversion chain. FiberAlert can also be enabled at the main site.

If a cable fault occurs on the remote devices' twisted pair port, then TX LinkLoss detects the fault and disable the OPTICS port.

If a cable fault occurs on the remote devices fiber optics' port, then FX LinkLoss detects the fiber loss and disables the Twisted Pair port.

The link fault is passed through the media conversion and is observed at each end. It acts just like it would if the devices were directly connected.

For more information on LinkLoss/FiberAlert, visit the IMC Networks Web site at http://www.imcnetworks.com/support/ If unsure of how to implement these features in a specific configuration, contact IMC Networks Technical Support at (800) 624-1070 (U.S./Canada), +32-16-550880 (Europe) or via e-mail at: techsupport@imcnetworks.com.

## Preferred/Forced Mode

In addition to Master/Slave Modes, McBasic-Gigabit module also includes Preferred/Forced Modes for Master/Slave negotiation. Preferred Mode helps determine whether the module should act as a Master or Slave. Forced Mode should typically only be used when connecting to some legacy switches, or when there is difficulty establishing a link. The default is Preferred Mode (S1-1 is ON).

Since most switches today typically function as Masters, IMC Networks recommends configuring McBasic-Gigabit as indicated in the table.

| DIP Switch | Feature | Setting |
|---|---|---|
| S1-1 | Preferred/ Forced | ON (Preferred) |

## FX Negotiation on McBasic-Gigabit

McBasic-Gigabit module includes the FX Auto Negotiation feature which negotiates duplex mode. This feature must be enabled or disabled on both ends of the connection or there may have difficulty establishing a link. If the device being connected to the McBasic-Gigabit module does not support Auto Negotiation, disabling the feature on the McBasic-Gigabit module forces the link up.

DIP Switch settings for FX AN:

| DIP Switch | Setting |
|---|---|
| S1-5 | FX AN = ON |

## Installing a McBasic-Gigabit

To install McBasic-Gigabit, first make sure that the unit is placed on a suitable flat surface. Attach the cables between the McBasic-Gigabit and each device that will be interconnected and then plug the unit into a reliable, filtered power source.

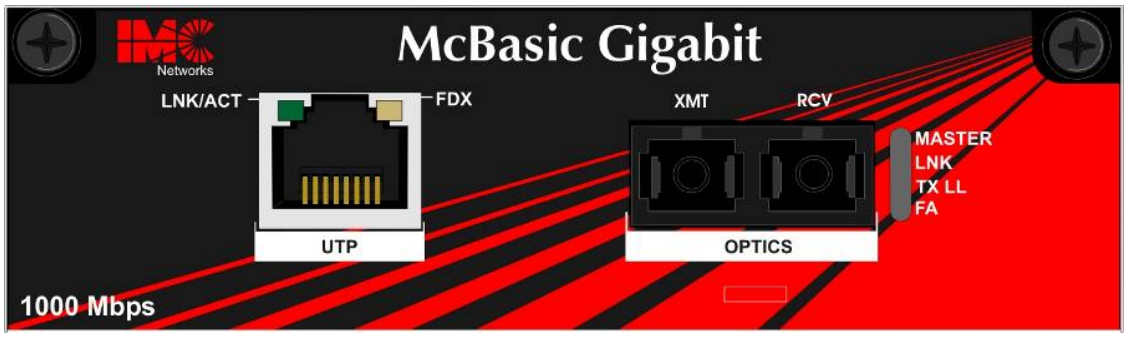
| INSTALLATION TIP |
| --- |
| *Since single-strand fiber products use optics that transmit and receive on two different wavelengths, you must deploy single-strand fiber products in pairs, or connect two compatible IMC Networks single-strand fiber products. For example, connect McBasic-Gigabit, TX/SSFX-SM1310-SC (which has 1310 xmt and 1550 rcv) to a product which has 1550 xmt and 1310 rcv, e.g. McGigabit, TX/SSFX-SM1550-SC. The two connected products must also have the same speed and distance capabilities (i.e. both are single-mode [20 km] or both are single/PLUS [40 km]).* |

## AutoCross Feature for Twisted Pair Connection

All twisted pair ports on the Managed Media Converter Module 10/100-II include AutoCross, a feature that automatically selects between a crossover workstation and a straight-through connection depending on the connected device.

## LED Operation

Each McBasic-Gigabit Converter features diagnostic LEDs that provide information on features and ports.




| McBasic-Gigabit w/LFPT | |
|---|---|
| **LNK/ACT** | Glows green when a twisted pair link is established. Blinks green when data is detected on the port. Located on RJ-45 connector. |
| **FDX** | Glows amber when port is operating in Full-Duplex Mode on the RJ-45 connector. |
| **FXLL** | Glows green when operating in Full-Duplex Mode. |
| **TXLL** | Glows green when TX LinkLoss is enabled on the port. |
| **LNK** | Glows green when a twisted pair link is established. |
| **FA** | Glows green when FiberAlert is enabled. |

## Installation Troubleshooting

- During installation, first test the fiber and twisted pair connections with all Troubleshooting features disabled, then enable these features, if desired, just before final installation. This will reduce the features' interference with testing.

If using a high powered device (which is designed for long distance installations) for a short distance installation, the fiber transmitters may overdrive the receivers and cause data loss. If this is the case, an optical attenuator may need to be added to the connection.

For fiber specifications, visit the IMC Networks Web site at: www.imcnetworks.com/adocs/fcs.asp or contact IMC Networks for more information.

## Specifications

### Environmental

### Operating Temperature

32° - 122° F (0° - 50° C)

### Storage Temperature

130° - 158° F (-25° - 85° C)

### Humidity

5 - 95% (non-condensing)

### Power Consumption (Typical)

McBasic-Gigabit w/LFPT:  100 – 240V AC, 50/60Hz, 0.2/0.1A

### Fiber Optic Specifications

For fiber optic specifications, please visit:
http://www.imcnetworks.com/adocs/fcs.asp

## IMC Networks Technical Support


**Tel:** (949) 465-3000 or (800) 624-1070 (in the U.S. and Canada);

+32-16-550880 (Europe)

**Fax:** (949) 465-3020

**E-Mail:** techsupport@imcnetworks.com

**Web:** www.imcnetworks.com

## Fiber Optic Cleaning Guidelines

Fiber Optic transmitters and receivers are extremely susceptible to contamination by particles of dirt or dust, which can obstruct the optic path and cause performance degradation. Good system performance requires clean optics and connector ferrules.

1. Use fiber patch cords (or connectors, if you terminate your own fiber) only from a reputable supplier; low-quality components can cause many hard-to-diagnose problems in an installation.
2. Dust caps are installed at IMC Networks to ensure factory-clean optical devices. These protective caps should not be removed until the moment of connecting the fiber cable to the device. Should it be necessary to disconnect the fiber device, reinstall the protective dust caps.
3. Store spare caps in a dust-free environment such as a sealed plastic bag or box so that when reinstalled they do not introduce any contamination to the optics.
4. If you suspect that the optics have been contaminated, alternate between blasting with clean, dry, compressed air and flushing with methanol to remove particles of dirt.

## Electrostatic Discharge Precautions

Electrostatic discharge (ESD) can cause damage to any product, add-in modules or stand alone units, containing electronic components. Always observe the following precautions when installing or handling these kinds of products

1. Do not remove unit from its protective packaging until ready to install.
2. Wear an ESD wrist grounding strap before handling any module or component. If the wrist strap is not available, maintain grounded contact with the system unit throughout any procedure requiring ESD protection.
3. Hold the units by the edges; do not touch the electronic components or gold connectors.
4. After removal, always place the boards on a grounded, static-free surface, ESD pad or in a proper ESD bag. Do not slide the modules or stand alone units over any surface.

**WARNING!** Integrated circuits and fiber optic components are extremely susceptible to electrostatic discharge damage. Do not handle these components directly unless you are a qualified service technician and use tools and techniques that conform to accepted industry practices.

## Safety Certifications

UL/CUL: Listed to Safety of Information Technology Equipment, including Electrical Business Equipment.

CE: The products described herein comply with the Council Directive on Electromagnetic Compatibility (2004/108/EC) and the Council Directive on Electrical Equipment Designed for use within Certain Voltage Limits (2006/95/EC). Certified to Safety of Information Technology Equipment, Including Electrical Business Equipment. For further details, contact IMC Networks.

**Class 1 Laser product, Luokan 1 Laserlaite,**
**Laser Klasse 1, Appareil A'Laser de Classe 1**

European Directive 2002/96/EC (WEEE) requires that any equipment that bears this symbol on product or packaging must not be disposed of with unsorted municipal waste. This symbol indicates that the equipment should be disposed of separately from regular household waste. It is the consumer's responsibility to dispose of this and all equipment so marked through designated collection facilities appointed by government or local authorities. Following these steps through proper disposal and recycling will help prevent potential negative consequences to the environment and human health. For more detailed information about proper disposal, please contact local authorities, waste disposal services, or the point of purchase for this equipment.

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